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P3.3 - CREATION OF A FUNGAL LIBRARY AND SCREENING OF ANTIMICROBIAL AND ANTICANCER ACTIVITY

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ABSTRACT

According to the World Health Organization, cancer and infectious diseases are two of the most problematic diseases nowadays. Cancer kills 10 million people every year and the emergence of resistance to antitumoral drugs is an important medical challenge. At the same time, antimicrobial resistance (AMR) is also a serious threat to human and environmental health. Besides mortality, AMR burdens healthcare services and dampens medical procedures such as surgeries, cancer treatments and other invasive procedures. The development of new drug therapies to fight drug resistance is essential to contest the rising of resistant bacteria and reduction of the effectiveness of antitumoral drugs.

Microorganisms have been a major source for natural compounds throughout the years. Fungi, renowned for their ability to produce an array of broad and diverse secondary metabolites, offer a rich resource for drug discovery.

We built a collection of fungal species, isolated from chestnuts, sunflower seeds, and chestnut flour, and explored their extracts for potential antimicrobial and anticancer activity. Fungi cultures for secondary metabolite biosynthesis were done in submerged fermentation in Malt Extract broth for 15 days at 26 °C. Liquid-liquid extraction techniques, with ethyl acetate as a solvent, were applied to obtain crude secondary metabolite extracts.

Clinical resistant bacteria, yeasts, and prostate cell lines (human prostate epithelial cells – HpepiC; human caucasian prostate adenocarcinoma cells - PC3) were exposed to fungal extracts at a single concentration of 100 µg/mL.

Our results so far show several extracts with antimicrobial and/or anticancer activity without decreasing cell viability of non-tumoral cells, showing their potential as therapeutic drugs without possible secondary effects. Although, more studies should be done, and pending fungal identification will allow us to select which extracts will be further investigated to find if the displayed bioactivity could be happening due to unknown natural compounds.

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